

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently amended) A computer program product (hereinafter "container") recorded on computer readable medium for organizing and manipulating Web services on a network, comprising:

computer executable instructions for determining and describing Web services that are available at a corresponding network node, said Web services comprising software modules that can be exchanged between nodes of a network and run at said nodes;

computer executable instructions for generating messages to be transmitted to other containers via a network disclosing said Web services that are available at said corresponding network node;

computer executable instructions for receiving and deciphering messages disclosing Web services that are available at other network nodes corresponding to other containers; and

computer executable instructions for causing the dynamic reconfiguration of said Web services available at said corresponding network node on said network based on said transmitted and received messages, including the exchange of said Web services between said network nodes;

wherein said container is in the form of a Web service.

2. (Previously presented) The computer program product of Claim 1 wherein said computer executable instructions for causing the dynamic reconfiguration of Web services comprises:

computer executable instructions for transmitting messages to said other containers requesting said other containers to return copies of Web services software; and

computer executable instructions, responsive to receipt of messages from said other containers requesting copies of Web services software available at said corresponding network mode, for sending copies of said requested Web services software to said requesting containers.

3. (Previously presented) The computer program product of Claim 2 wherein said computer executable instructions for transmitting messages generates messages that are hardware and software platform independent.

4. (Previously presented) The computer program product of Claim 3 wherein said computer executable instructions for transmitting messages further comprises computer executable instructions for transmitting said messages to and from a Web services registry and said computer readable code for receiving and deciphering messages further comprises computer readable code for receiving said messages from a Web service registry.

5. (Original) The computer program product of Claim 4 wherein said messages disclosing said Web services that are available at network nodes are in the Web Services Descriptor Language (WSDL).

6. (Original) The computer program product of Claim 5 wherein said registry is a Universal Description, Discovery, and Integration initiative (UDDI) registry.

7. (Previously presented) The computer program product of Claim 3 wherein said computer executable instructions for transmitting messages executable instructions uses a peer to peer messaging protocol between said containers and said computer readable code for receiving and deciphering messages uses a peer to peer messaging protocol between containers.

8. (Original) The computer program product of Claim 7 wherein said messaging protocol is SOAP.

9. (Original) The computer program product of Claim 8 wherein said disclosures of said Web services that are available at network nodes are contained in headers of Simple Object Access Protocol (SOAP) messages.

10. (Original) The computer program product of Claim 7 wherein said messaging protocol is JXTA.

11. (Previously presented) The computer program product of claim 3 further comprising:

computer executable instructions for receiving client requests for use of a Web services from client computers via said network.

12. (Currently amended) The computer program product of claim 11 wherein said computer executable instructions for causing the dynamic reconfiguration of Web services comprises:

computer executable instructions that, responsive to receipt of a one of said client requests from a client for a Web service that is not available at said corresponding network node;

determines, based on said received messages disclosing said Web services that are available at other network nodes, whether another network node has a copy of said particular Web service; and

invokes a proxy to another of said containers having a copy of a particular Web service based on said determination.

13. (Currently amended) The computer program product of claim 12 wherein said proxy comprises:

computer executable instructions for routing said client requests for a Web service that is not available at said corresponding network node and has been determined to be available at another network node to another container corresponding to said another network node;

computer executable instructions for receiving responses to said client requests from said another network node; and

computer executable instructions for returning said responses to said requesting clients.

14. (Currently amended) The computer program product of claim 13 further comprising:

computer executable instructions for receiving said client requests routed from another of said containers and causing said client requests to be handled by a copy of said particular Web service at a network node corresponding to said container to generate said response; and

computer executable instructions for transmitting said response to said another container that routed said client request to said container.

15. (Previously presented) The computer program product of claim 11 further comprising:

computer executable instructions for determining a load of client requests at said corresponding network node; and

wherein said computer executable instructions for causing the dynamic reconfiguration of Web services performs said dynamic reconfiguration based on said load determination.

16. (Currently amended) The computer program product of claim 15 wherein said computer executable instructions for causing the dynamic reconfiguration of Web services further comprises:

computer executable instructions that, responsive to determination of a load of client requests for a particular Web service that is not available at said corresponding network node exceeding a predetermined level, issues a request for message requesting a copy of said particular Web service from another container that has a copy of said particular Web service;

computer executable instructions for receiving and locally invoking said particular Web service from said other container; and

computer executable instructions for routing client requests for said particular Web service to said local invocation of said particular Web service.

17. (Currently amended) The computer program product of claim 16 wherein said computer executable instructions for causing the dynamic reconfiguration of Web services further comprises:

computer executable instructions for offloading said said particular Web service received from said other container responsive to said load of client requests for said particular Web service dropping below a second predetermined level.

18. (Currently amended) The computer program product of claim 15 wherein said computer executable instructions for causing the dynamic reconfiguration of Web services comprises:

computer executable instructions that, responsive to determination of a load of client requests for a particular Web service available at said corresponding network node exceeding a predetermined level, issues a request for message requesting another container to accept a copy of the code of said particular Web service from said computer program product; and

computer executable instructions for sending a copy of said code of said particular Web service to said other container responsive to affirmative responses to said request message requesting another container to accept a copy of the code of said particular Web service from said computer program product.

19. (Previously presented) The computer program product of claim 18 wherein said computer executable instructions for causing the dynamic reconfiguration of Web services further comprises:

computer executable instructions for reconfiguring said computer program product to route client requests for said particular Web service to said other container.

20. (Original) The computer program product of claim 19 wherein said other container comprises a plurality of other containers.

21. (Previously presented) The computer program product of claim 20 wherein said computer executable instructions for reconfiguring said computer program product to route client requests for said particular Web service to said other container distributes said client requests for said particular Web service between said other containers and said local invocation of said particular Web service.

22. (Previously presented) The computer program product of claim 11 wherein said client requests indicate whether said requesting client has a container and a platform on which said client is running and wherein said computer program product further comprises computer executable instructions to read said client requests to determine whether said client has a container and said platform.

23. (Previously presented) The computer program product of claim 22 wherein said computer executable instructions for causing the dynamic reconfiguration of Web services further comprising:

computer executable instructions for sending a copy of the code of a particular Web service responsive to a client request for said Web service.

24. (Previously presented) The computer program product of claim 11 further comprising:
computer executable instructions for monitoring usage of Web services by clients; and
computer executable instructions for charging said clients for said usage.

25. (Currently amended) A method for organizing and manipulating Web services, comprising the steps of:

(1) determining and describing Web services that are available at a corresponding network node, said Web services comprising software modules that can be exchanged between nodes of a network and run at said nodes;

(2) transmitting messages via a network disclosing said Web services that are available at said corresponding network node to other network nodes via said network;

(3) receiving and deciphering messages from other network nodes disclosing Web services that are available at other network nodes; and

(4) dynamically reconfiguring Web services on said network node transmitted and received based on said messages, including the exchange of said Web services between said network nodes;

wherein said method is in the form of a Web service.

26. (Previously presented) The method of Claim 25 wherein step (4) further comprises:

(4.1) transmitting messages to said other network nodes requesting said other network nodes to return copies of Web services software; and

(4.2) computer executable instructions, responsive to receipt of messages from said other network nodes requesting copies of Web services software, for sending said requested Web services software to said requesting network node.

27. (Original) The method of Claim 26 wherein said messages of steps (2) and (3) are hardware and software platform independent.

28. (Original) The method of Claim 27 wherein steps (2) and (3) comprise sending and receiving said messages to and from a Web services registry.

29. (Original) The method of Claim 28 wherein said messages disclosing said Web services that are available at network nodes are in the Web Services Descriptor Language (WSDL).

30. (Original) The method of Claim 29 wherein said registry is a Universal Description, Discovery, and Integration initiative (UDDI) registry.

31. (Original) The method of Claim 27 herein steps (2) and (3) comprise sending and receiving said messages using a peer to peer messaging protocol between said network nodes.

32. (Original) The method of Claim 31 wherein said messaging protocol is SOAP.

33. (Original) The method of Claim 32 herein said disclosures of said Web services that are available at network nodes are contained in headers of Simple Object Access Protocol (SOAP) messages.

34. (Original) The method of Claim 31 herein said messaging protocol is JXTA.

35. (Currently amended) The method of claim 27 further comprising the step of:

(5) receiving client requests for Web services from client computers via said network.

36. (Currently amended) The method of claim 35 wherein step (4) further comprises:

(4.3) responsive to receipt of a client request from a client for a Web service that is not available at said corresponding network node;

determining, based on said received messages disclosing said Web services that are available at network nodes, what network nodes have copies of said particular Web service; and

invoking a proxy to another of said network nodes having a copy of a particular Web service based on said determination.

37. (Currently amended) The method of claim 36 wherein said proxy performs the steps of:

(4.3.1) routing client requests for said particular Web service to said other of said network nodes;

(4.3.2) receiving responses to said client requests; and

(4.3.3) returning said responses to said requesting clients.

38. (Currently amended) The method of claim 37 further comprising:

(6) receiving said client requests forwarded from other of said network nodes and causing said client requests to be handled by said copy of said particular Web service corresponding to said network node to generate said response; and

(7) transmitting said response to said network node that issued said client request.

39 (Original) The method of claim 35 further comprising:

(8) determining a load of client requests at said corresponding network node;

and

wherein, in step (4), said dynamic reconfiguration is performed based on said load determination.

40. (Currently amended) The method of claim 39 herein step (4) further comprises:

(4.4) responsive to determination of a load of client requests for a particular Web service that is not available at said corresponding network node exceeding a predetermined level, issuing a ~~request for~~ message requesting a copy of the code of said particular Web service from another network node that has a copy of said particular Web service;

(4.5) receiving and locally invoking said code for said particular Web service from said other network node; and

(4.6) routing client requests for said particular Web service to said local invocation of said code for said particular Web service.

41. (Original) The method of claim 40 wherein step (4) further comprises:

(4.7) offloading said local code for said particular Web service responsive to said load of client requests for said particular Web service dropping below a second predetermined level.

42. (Currently amended) The method of claim 39 wherein step (4) comprises:

(4.8) responsive to determination of a load of client requests for a particular Web service available at said corresponding network node exceeding a predetermined level, issuing a ~~request for~~ message requesting another network node to accept a copy of the code of said particular Web service from said network node; and

(4.9) sending a copy of said code of said particular Web service to said other network node responsive to affirmative responses to said request message requesting another network node to accept a copy of the code of said particular Web service from

said network node.

43. (Original) The method of claim 42 wherein step (4) further comprises:
(4.10) reconfiguring said network node to route client requests for said particular Web service to said other network node.

44. (Original) The method of claim 43 wherein said other network node comprises a plurality of other network nodes.

45. (Original) The method of claim 44 wherein step (4.10) comprises distributing said client requests for said particular Web service between said other network nodes and said local invocation of said particular Web service.

46. (Original) The method of claim 35 wherein said client requests indicate a platform on which said client is running and wherein said method further comprises the step of:

(9) reading said client requests to determine said platform of said client.

47. (Original) The method of claim 46 further comprising the step of:
(10) sending a copy of the code of a particular Web service responsive to a client request for said Web service.

48. (Original) The method of claim 35 further comprising the steps of:

(11) monitoring usage of Web services by clients; and

(12) charging said clients for said usage.